10.0 Know the definitions of the *mean, median, and mode of distribution* of data and can compute each of them in particular situations.

11.0 Compute the variance and the standard deviation of a distribution of data.

12.0 Find the line of best fit to a given distribution of data by using least squares regression.

13.0 Know what the *correlation coefficient of two variables* means and are familiar with the coefficient's properties.

14.0 Organize and describe distributions of data by using a number of different methods, including frequency tables, histograms, standard line graphs and bar graphs, stem-and-leaf displays, scatterplots, and box-and-whisker plots.

15.0 Are familiar with the notions of a statistic of a distribution of values, of the sampling distribution of a statistic, and of the variability of a statistic.

16.0 Know basic facts concerning the relation between the mean and the standard deviation of a sampling distribution and the mean and the standard deviation of the population distribution.

17.0 Determine confidence intervals for a simple random sample from a normal distribution of data and determine the sample size required for a desired margin of error.

18.0 Determine the P-value for a statistic for a simple random sample from a normal distribution.

19.0 Students are familiar with the *chi*-square distribution and *chi*-square test and understand their uses.

Senate Bill 2X
High School Exit Exam Highlights

• Senate Bill 2X requires all students completing grade twelve to pass a high school exit exam in language arts and math commencing in 2003–04.

• The bill requires the State Superintendent of Public Instruction to develop and the State Board of Education to approve the exam by October 1, 2000.

• Beginning in 2000–01, grade nine students will be eligible to take the exam.

• Beginning in 2001–02, grade ten students will be required to take the exam.

• The law does not make the exam a requirement for graduation until 2003–04.

• If a pupil does not possess sufficient English language skills to be assessed by the exit exam, the district may defer the requirement that the student pass the exam "for a period of up to 24 calendar months of enrollment in the California public school system until the pupil has completed six months of instruction in reading, writing, and comprehension in the English language."
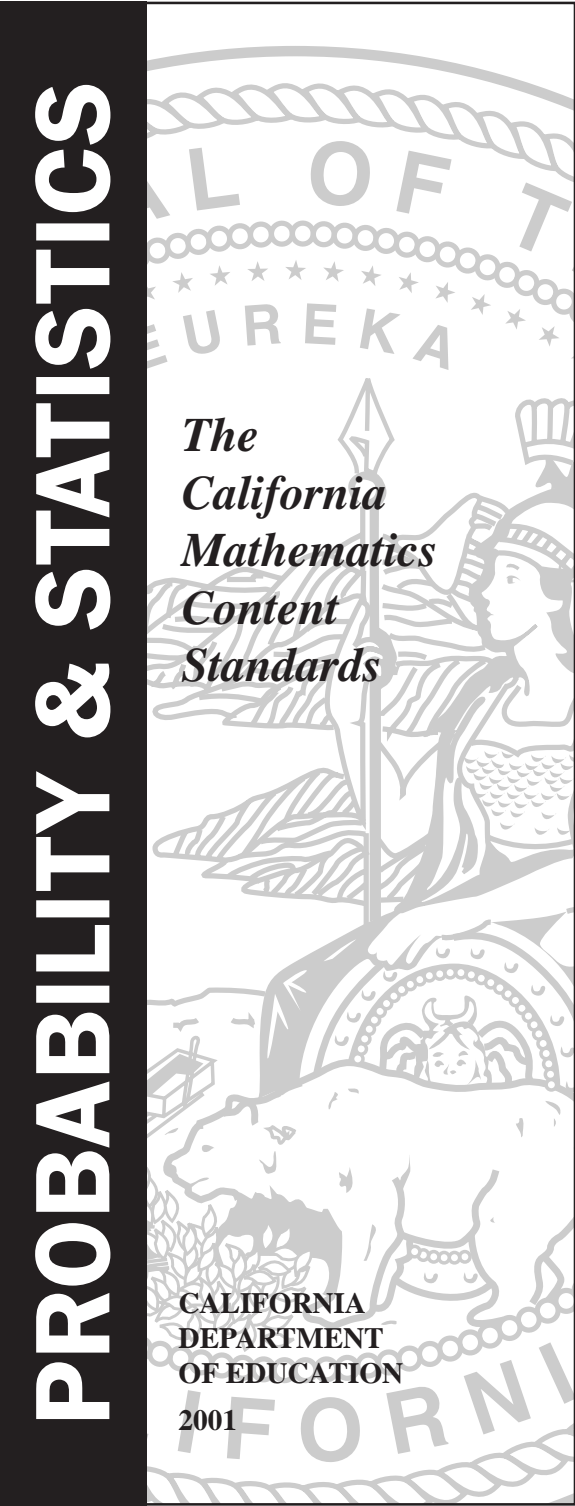
College Entrance Requirements

Parents generally know that many colleges require good high school grades for admission. Although grades are important, students do not have to have top grades to get into college. There are colleges for every student. You should also know that students need to take a specific series of college preparatory classes in high school, and the minimum requirements vary depending on the selected college or university. The a–g requirements noted below are submitted by the Regents of the University of California and are generally the most rigorous:

   a. An English class every semester of every year for four years.

   b. A mathematics class every semester of every year for three years, including algebra and geometry. Four years are recommended.

   c. Two years of a laboratory science beyond the ninth grade. An additional year is recommended.

   d. Two years of history–social science, which are to include U.S. government, world history, culture, and geography.

   e. Two years of the same language other than English.

   f. Two years of college preparatory electives in addition to those required in "a–e" above.

   g. One year of visual and performing arts, effective for the entering class of 2003.

Every high school has a list of acceptable classes and can tell you how many should be taken. At least one class in the area of visual or performing arts is a good choice for many students.

To gain admission to college, your children must also take either the Scholastic Assessment Test (SAT) or the American College Test (ACT) and submit the scores. Find out when the tests are given and be sure your children sign up to take one of them.

PROBABILITY & STATISTICS

The California Mathematics Content Standards

CALIFORNIA DEPARTMENT OF EDUCATION

2001

The California Mathematics Content Standards

ACADEMIC CONTENT STANDARDS IN CRITICAL curriculum areas are an important part of educational reform in California. This brochure provides an overview of the California Department of Education's approach to meeting the academic needs of your child in the core curricular areas (math, science, history-social science, and language arts). A copy of the mathematics content standards adopted by the State Board of Education is included.

Well-communicated standards spell out what students learn in a specific subject. School districts must adopt the state standards or use them as a foundation for creating their own district standards. When a school district develops standards, they must be as rigorous and challenging as the state standards.

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The standards for grades eight through twelve are organized differently from those for kindergarten through grade seven. In this section strands are not used for organizational purposes as they are in the elementary grades because the mathematics studied in grades eight through twelve falls naturally under discipline headings: algebra, geometry, and so forth. Many schools teach this material in traditional courses; others teach it in an integrated fashion.

To allow local educational agencies and teachers flexibility in teaching the material, the standards for grades eight through twelve do not mandate that a particular discipline be initiated and completed in a single grade. The core content of these subjects must be covered;

students are expected to achieve the standards however these subjects are sequenced.

Standards are provided for algebra I, geometry, algebra II, trigonometry, mathematical analysis, linear algebra, probability and statistics, Advanced Placement probability and statistics, and calculus. Many of the more advanced subjects are not taught in every middle school or high school. Moreover, schools and districts have different ways of combining the subject matter in these various disciplines. For example, many schools combine some trigonometry, mathematical analysis, and linear algebra to form a precalculus course. Some districts prefer offering trigonometry content with algebra II. . . .

What is described in this section are standards for the academic content by discipline; the document does not endorse a particular choice of structure for courses or a particular method of teaching the mathematical content.

Probability and Statistics

This discipline is an introduction to the study of probability, interpretation of data, and fundamental statistical problem solving. Mastery of this academic content will provide students with a solid foundation in probability and facility in processing statistical information.

Students:

1.0 Know the definition of the notion of *independent events* and can use the rules for addition, multiplication, and complementation to solve for probabilities of particular events in finite sample spaces.

2.0 Know the definition of *conditional probability* and use it to solve for probabilities in finite sample spaces.

3.0 Demonstrate an understanding of the notion of *discrete random variables* by using them to solve for the probabilities of outcomes, such as the probability of the occurrence of five heads in 14 coin tosses.

4.0 Are familiar with the standard distributions (normal, binomial, and exponential) and can use them to solve for events in problems in which the distribution belongs to those families.

5.0 Determine the mean and the standard deviation of a normally distributed random variable.

6.0 Know the definitions of the *mean, median, and mode* of a distribution of data and can compute each in particular situations.

7.0 Compute the variance and the standard deviation of a distribution of data.

8.0 Organize and describe distributions of data by using a number of different methods, including frequency tables, histograms, standard line and bar graphs, stem-and-leaf displays, scatterplots, and box-and-whisker plots.

Advanced Placement Probability and Statistics

This discipline is a technical and in-depth extension of probability and statistics. In particular, mastery of academic content for advanced placement gives students the background to succeed in the Advanced Placement examination in the subject.

Students:

1.0 Solve probability problems with finite sample spaces by using the rules for addition, multiplication, and complementation for probability distributions and understand the simplifications that arise with independent events.

2.0 Know the definition of *conditional probability* and use it to solve for probabilities in finite sample spaces.

3.0 Demonstrate an understanding of the notion of *discrete random variables* by using this concept to solve for the probabilities of outcomes, such as the probability of the occurrence of five or fewer heads in 14 coin tosses.

4.0 Understand the notion of a *continuous random variable* and can interpret the probability of an outcome as the area of a region under the graph of the probability density function associated with the random variable.

5.0 Know the definition of the *mean of a discrete random variable* and can determine the mean for a particular discrete random variable.

6.0 Know the definition of the *variance of a discrete random variable* and can determine the variance for a particular discrete random variable.

7.0 Demonstrate an understanding of the standard distributions (normal, binomial, and exponential) and can use the distributions to solve for events in problems in which the distribution belongs to these families.

8.0 Determine the mean and the standard deviation of a normally distributed random variable.

9.0 Know the central limit theorem and can use it to obtain approximations for probabilities in problems of finite sample spaces in which the probabilities are distributed binomially.